Preliminary Report

Evaluation of the Rare-Element Pegmatites in the Northwest Territories

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Pegmatite Studies in the Aylmer Lake Area, Northwest Territories

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INTRODUCTION

A reconnaissance study was initiated during the summer of 1988 in the Aylmer Lake-MacKay Lake basin(s), in the central part of the Slave Province of the Canadian Shield (Fig. 1, 2). The initial effort was aimed at the Aylmer Lake region and two areas to the southwest, at Kirk and Reid Lakes (Fig. 3). An isolated occurrence at Muskox Lake was also inspected, and a virgin pegmatite population at Thonokied Lake was discovered.

The purpose of the study is to explore the prospects for economically significant rare-element pegmatites in the above basin(s). The presence of pegmatites with Be, Nb-Ta and/or Li mineralization was indicated in the forties and fifties, when a total of 11 pegmatites was recorded, scattered over this 28,000 km^2 territory (Folinsbee 1947, 1949, 1952; Lord and Barnes 1954). Such a spread of mineralized pegmatites, together with the geological setting and metamorphic relationships in the region indicate that more localities should be present, related to outcropping or hidden parental granites.

Inspection of the locations of previously recognized pegmatite occurrences, and of areas identified as potential targets on air photographs, has led to the discovery of additional 55 pegmatite dikes. Many of these also carry beryl, columbite-tantalite and/or spodumene. The potential of the basin(s) is still wide open, as the work carried out in summer 1988 covered only about 60% of the area.

The examined pegmatite localities were sampled for geochemical characterization. Plutonic intrusions of granites suspected to be parental to the pegmatites were also sampled for whole-rock geochemical analysis. However, this work was so far only incidental to the pegmatite studies, as it was

considered essential to test the calibre of the pegmatite-bearing area first.

In consequence, pegmatite localities will be inspected in 1989 over the western 40% of the basin(s), in the areas of Thonokied Lake, Lac de Gras and MacKay Lake. Systematic sampling of the granitic intrusions will be required in most of the plutonic bodies of the whole area of interest.

AYLMER LAKE AREA

A total of 17 granitic pegmatites was examined at the junction of the western and northern arms of Aylmer Lake (Fig. 4). The pegmatites intrude metasedimentary schists, and they seem to form an envelope surrounding a granite outcropping as an island in the lake (Fig. 4). Their dimensions are variable from 3 x 5 m to 7 x 100 m, with one body in the extreme northeast reaching about 100 x 100 m. The pegmatites carry mainly beryl, in some cases also columbite-tantalite, and a number of dikes are barren.

Another series of pegmatites was found in the southern part of Aylmer Lake (Fig. 4). Two pegmatites contain columbite-tantalite plus beryl, one has beryl only. The largest intrusion measures 5 x 12 m in outcrop.

NEBBISH LAKE AREA

A total of 10 mineralized pegmatites was identified in this area. The pegmatites are scattered over a sizeable area. Most of them are close to one or another of two small granitic plutons northwest and southeast of Nebbish Lake, but two dikes are relatively close to a large granitic intrusion northeast of the lake (Fig. 4).

Four dikes contain beryl, columbite-tantalite was found with beryl in

one pegmatite, and five dikes carry spodumene. The four Li-bearing dikes to the south and east of the lake are particularly rich in spodumene. The outcrop dimensions of the pegmatites range from 5 x 12 m to 7 x 100 m.

REID LAKE AREA

A total of 5 mineralized pegmatites was inspected in this area, besides numerous dikes that appear to be barren. A single beryl-bearing pegmatite was found at the southern termination of the lake, relatively close to a granitic intrusion to the southeast (Fig. 5). Four beryl-bearing dikes, one of which also contains columbite-tantalite, are located at the northern end of the lake. They are considerably remote from any outcrop of granite (Fig. 5). The pegmatite outcrops range from 2 x 8 m to 5 x 12 m in size in this area.

Two Li-bearing pegmatites reported in the literature and marked in Fig. 5 could not be accessed in summer 1988.

KIRK LAKE AREA

A series of apparently barren pegmatites was examined in this area, concentrated around the northern end of the lake and surrounding a granite pluton situated there (Fig. 6). The pegmatite outcrops range from 3 x 6 m to 5 x 20 m in size. Only one of the pegmatites contains lazulite. If the pegmatites prove to be genetically related to the pluton central to their distribution, detailed examination of the outskirts of the known pegmatite population will be warranted. More fractionated and mineralized bodies may be located at a greater distance from the granitic parent.

THONOKIED LAKE AREA

This area shown on Fig. 1 was visited only briefly at the end of the field season. No pegmatites were reported from this area previously, but their presence was suspected from the distribution of fine-grained and pegmatitic two-mica granite intrusions in the area. A sizeable pegmatite population was discovered to the northeast of the lake, with distinct indication of regional paragenetic zoning. Detailed examination of this area will be performed at the beginning of the 1989 field season.

MUSKOX LAKE

A single pegmatite is located at Muskox Lake (Fig. 3), reported previously to contain columbite-tantalite. The outcrop of this dike is 5 x 10 m in size, in part aplitic, in part coarse pegmatitic with conspicuous quartz pods. It contains a black opaque mineral resembling columbite-tantalite but otherwise no other rare-element minerals. Aerial inspection of the vicinity did not reveal any other pegmatite outcrops.

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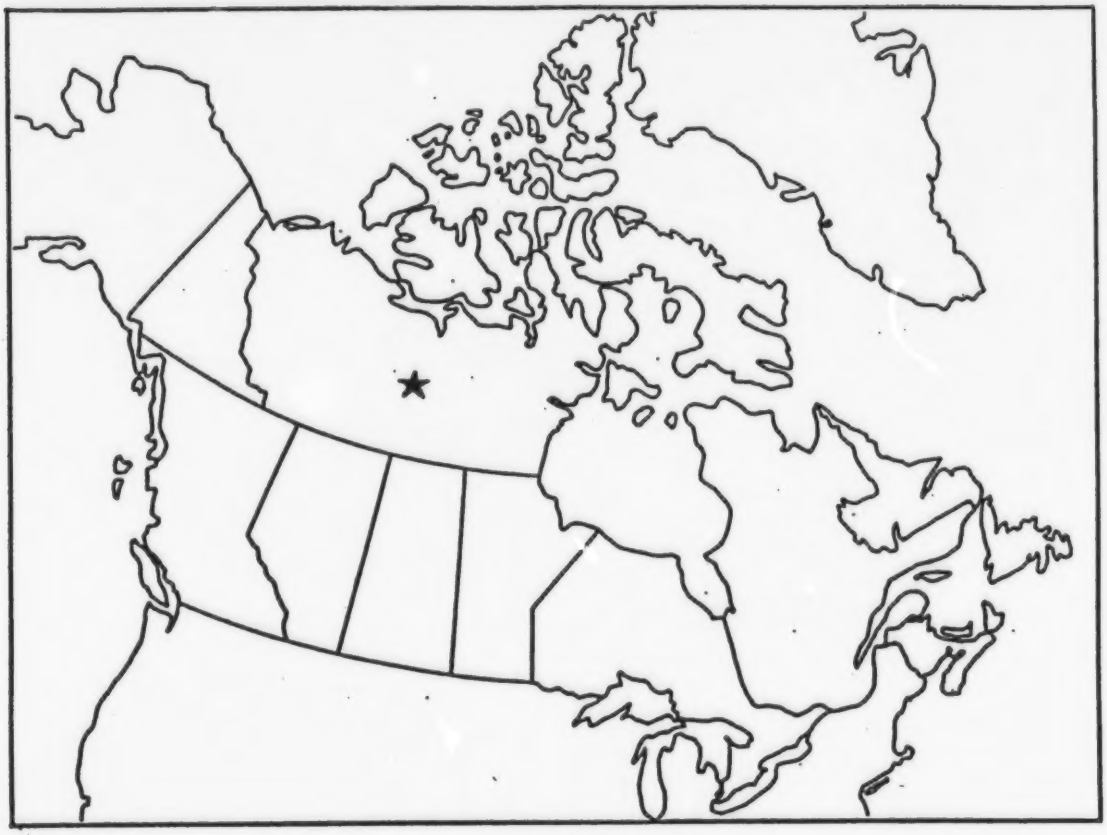

Fig. 1. Location of the Aylmer Lake-MacKay Lake area within Northwest Territories.

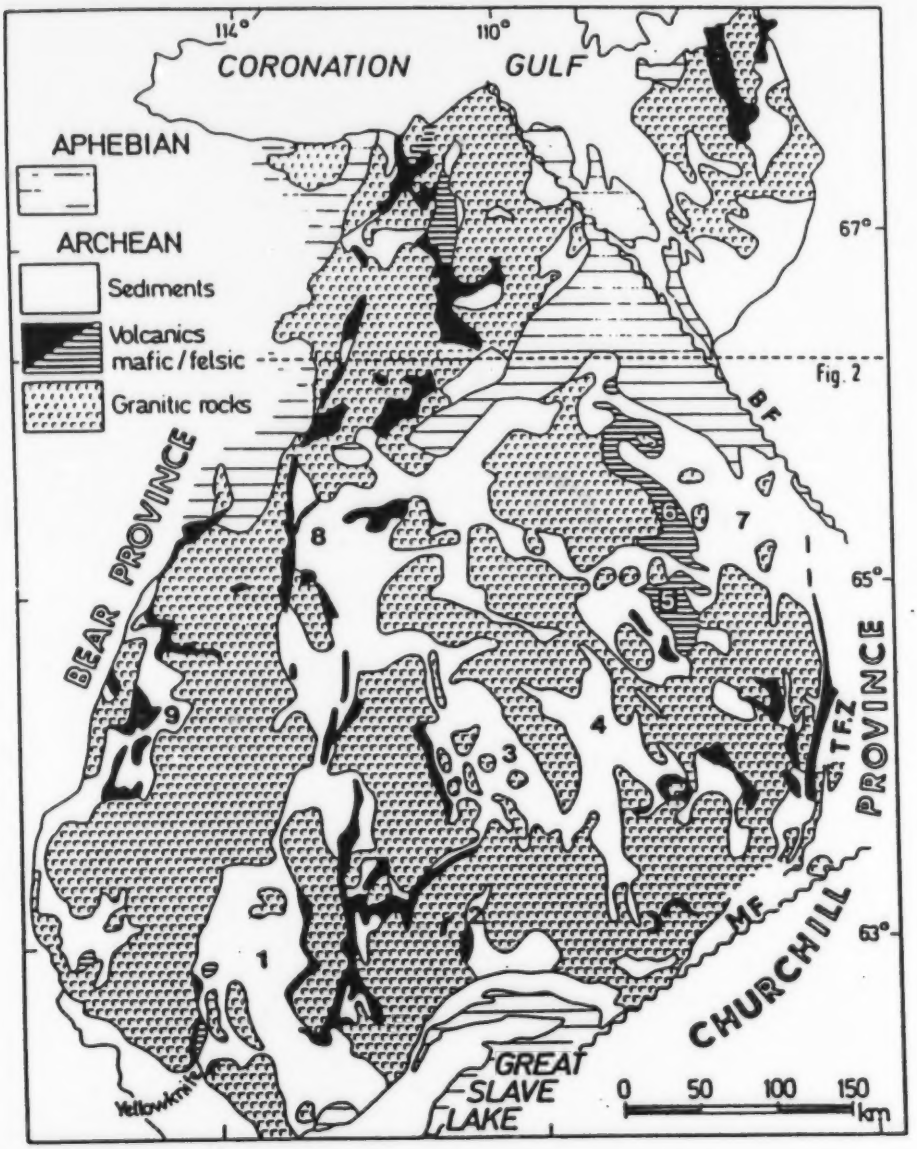

Fig. 2. Location of the Aylmer Lake (4) - MacKay Lake (3) area within the Slave Province.

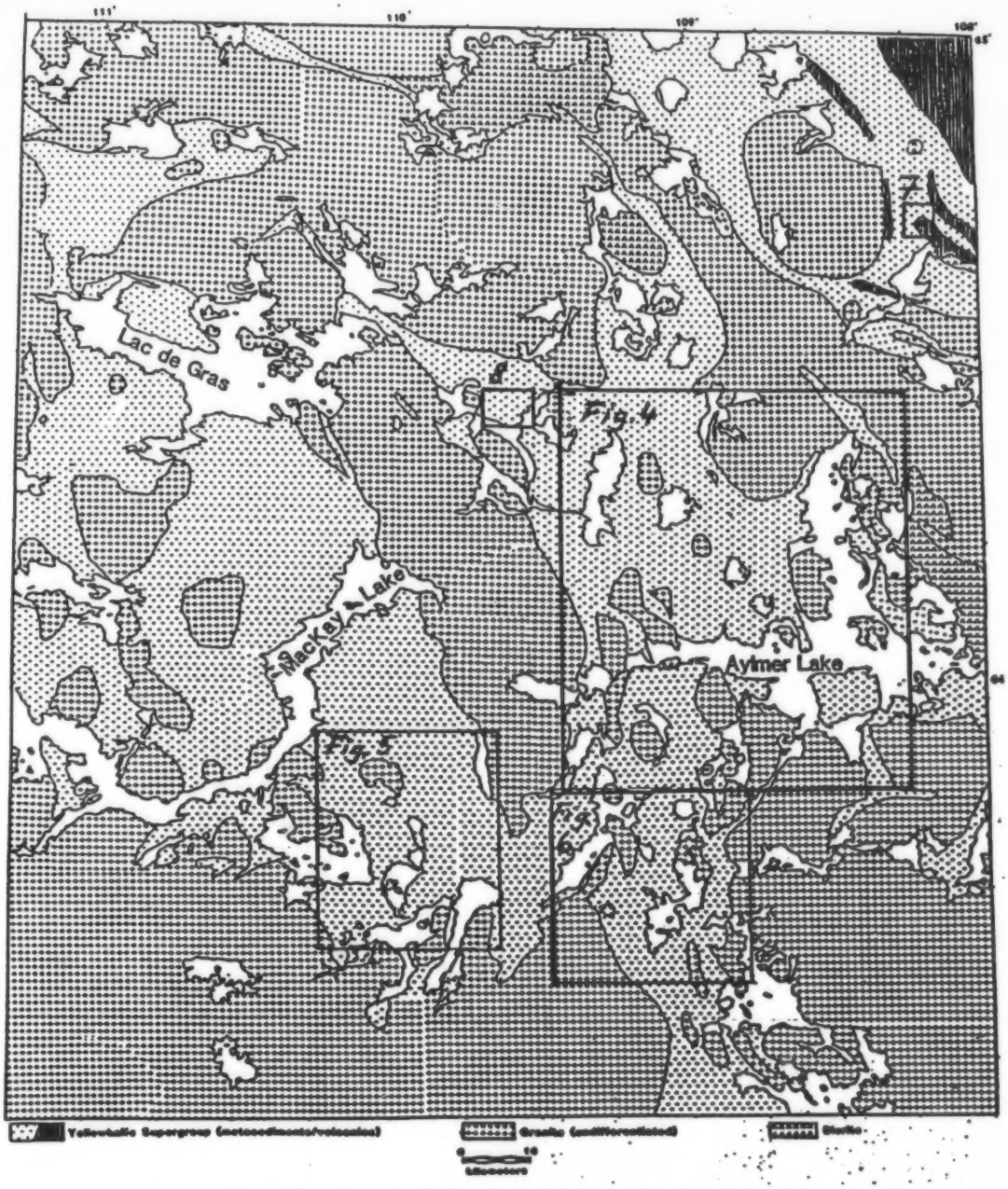

Fig. 3. Index map of the Aylmer Lake-MacKay Lake basin(s), showing the disposition of location maps of Aylmer Lake-Nebbish Lake (Fig.4), Reid Lake (Fig. 5), Kirk Lake (Fig. 6), Muskox Lake (#7 above) and Thonokied Lake (#8 above) pegmatite populations.

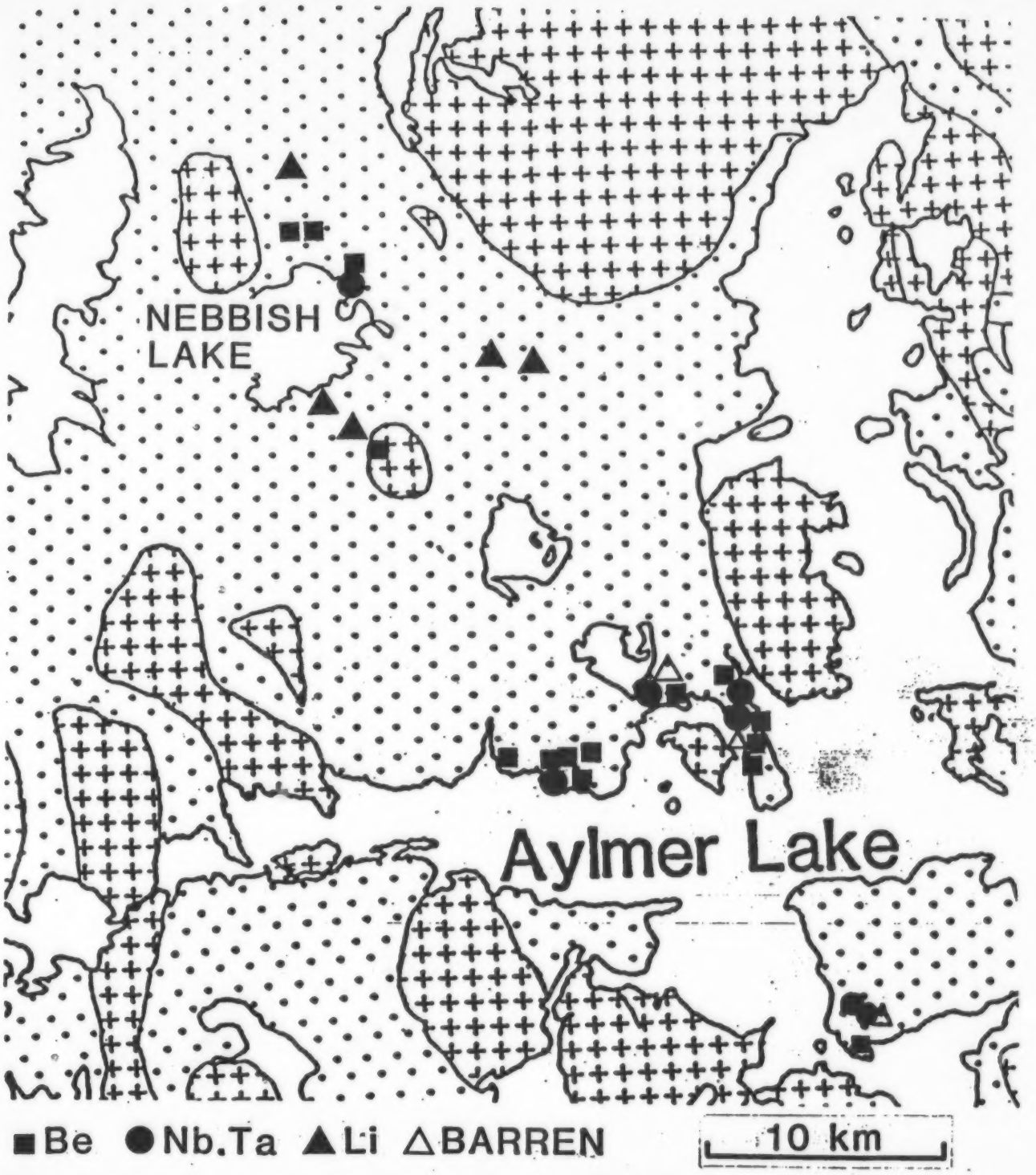

Fig. 4. Location map of pegmatite occurrences at Aylmer Lake and Nebbish Lake.

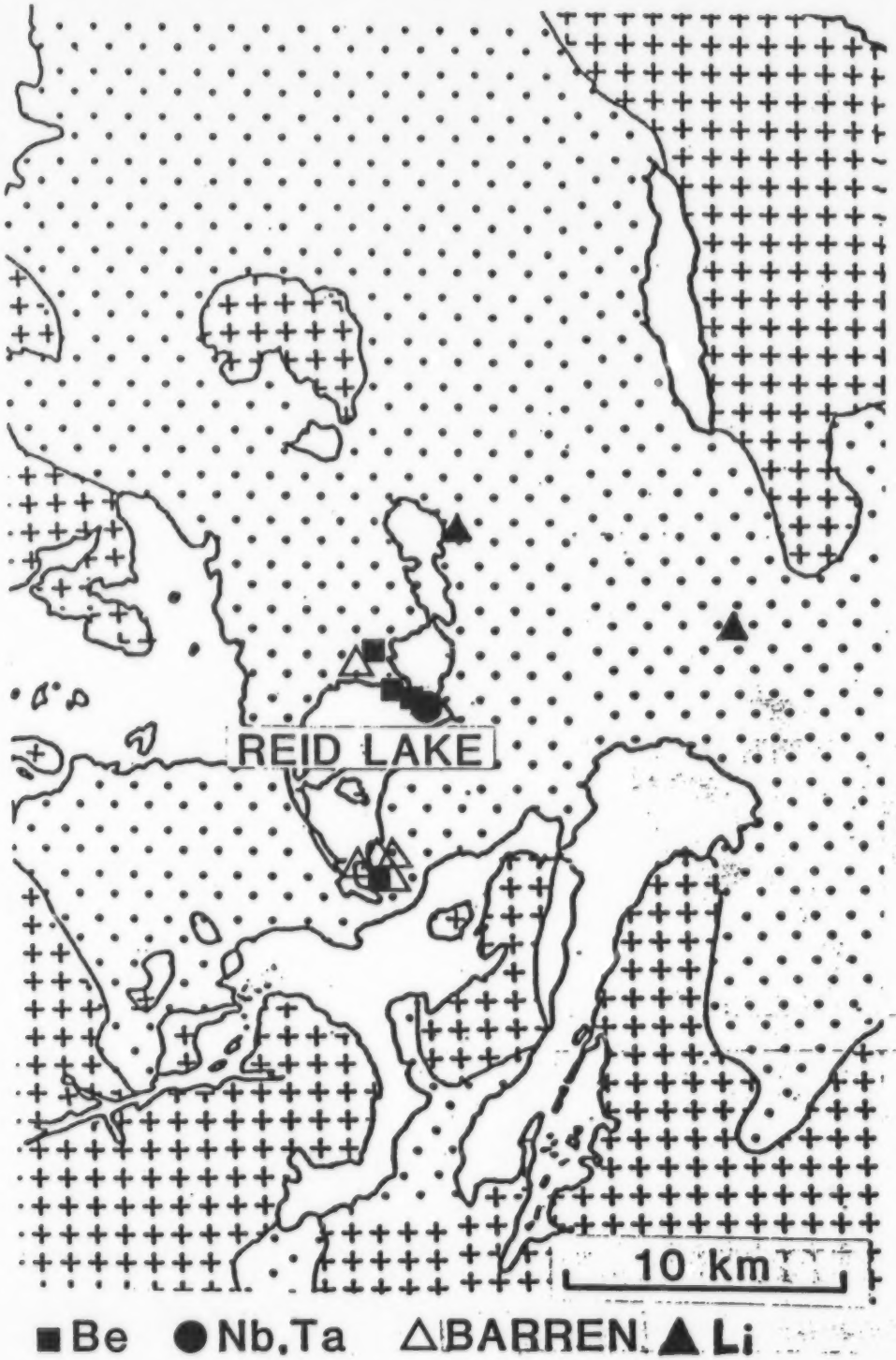

Fig. 5. Location map of the pegmatite occurrences at Reid Lake.

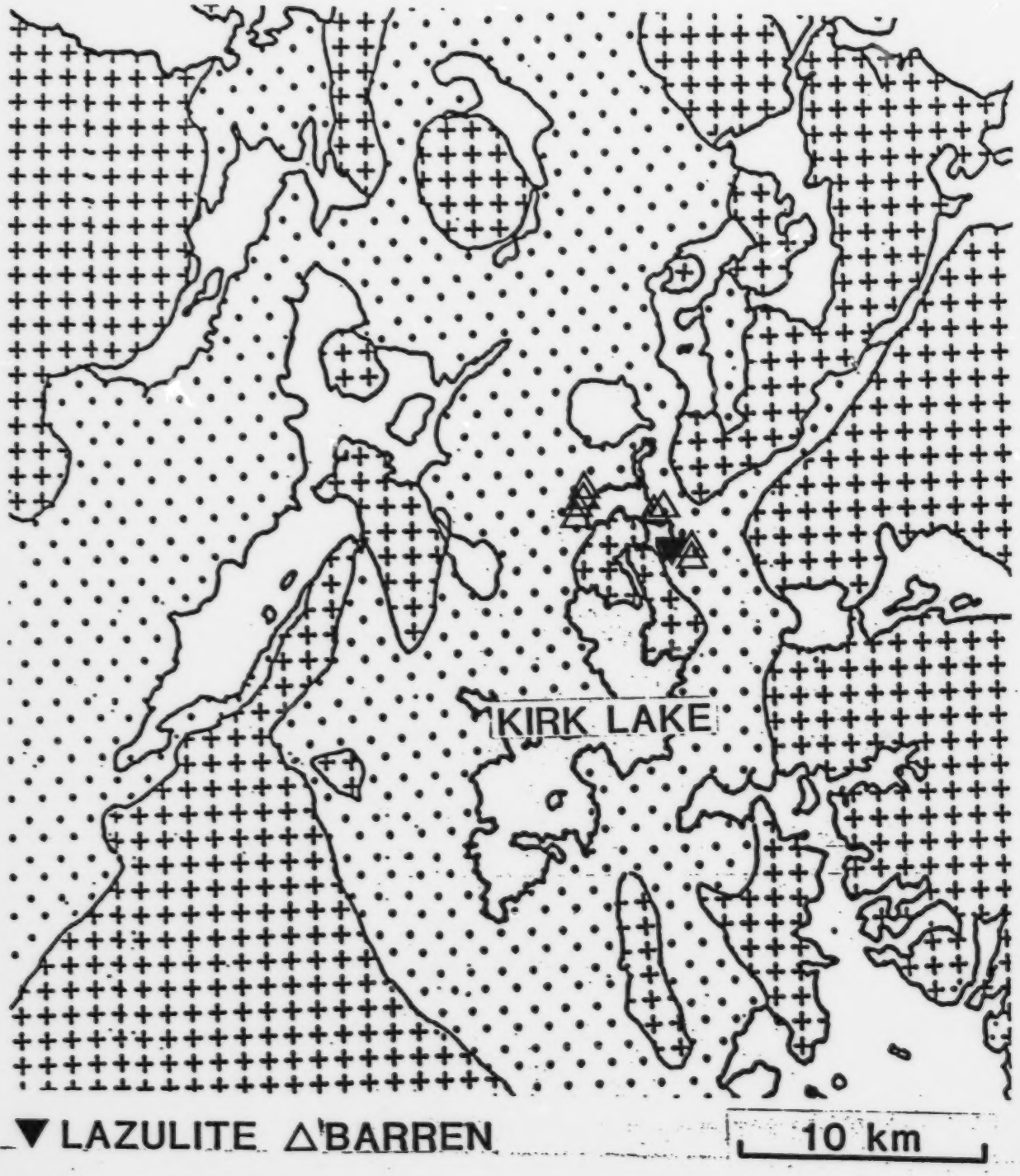

Fig. 6. Location map of the pegmatite occurrences at Kirk Lake.